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Air Power and Morale in the North African Campaign of the Second World War

By Dr Jonathan Fennell

One of the key outcomes of the improved delivery of air power in the North African campaign of the Second World War was the effect that it had on the morale of ground forces. Morale can be understood as the willingness of an individual or group to prepare for and engage in institutionally encouraged actions. The disasters that beset Eighth Army in the summer of 1942 were significantly influenced by a crisis in morale that fed into ineffective combat performance. This crisis in morale was turned around in dramatic fashion at Alam Halfa and El Alamein leading to more effective performance and ultimately victory in North Africa. The improved provision of air support for Eighth Army played an important role in this recovery of morale and in the gradual erosion and destruction of German and Italian willingness to fight. Practitioners, theorists and historians must take account of the extent to which air power is a morale weapon if they are fully to understand the past and utilise air power to its maximum effect today and in the future.

Introduction

Literature on air power in the North African campaign has focused on how the Desert Air Force and British and Commonwealth Armies overcame the technical and tactical challenges of combining air power and land power effectively on the battlefield.[1] The lessons learned in North Africa played a crucial role in the evolution of British and American operational doctrine and practice during the Second World War; the conduct of operations in Sicily, Italy and Northwest Europe were directly influenced by the innovations developed in the desert. John Terrain has gone so far as to say that 'it is certain that the potent system of land/air warfare hammered out so painfully in the desert between November 1941 and October 1942 was . . . the turning point' in transforming a defeated armed force into a war winning team.[2]

This literature has also acknowledged that one of the key outcomes of the improved delivery of air power, in the form of close air support and interdiction, was the psychological effect that it had on ground forces. Brad Gladman, for instance, has argued that, at Alam Halfa and El Alamein, Allied air power 'totally destroyed the morale and fighting ability of the Axis forces,' [3] leaving them like 'an eggshell awaiting the hammer blow'.[4] David Hall, in *Strategy for Victory*, has also pointed out that aerial bombardment can have 'a negative effect on the morale of front-line . . . troops wholly out of proportion to the damage caused and the threat presented'.[5]

The history of air power is, in fact, replete with references to the morale effect of aerial bombardment. Much of the literature has focused on strategic bombing offensives, such as those carried out against Germany and Japan in the Second World War.[6] More recently, scholars have also emphasized the critical importance of air power on the battlefield and the effect that it can have on front line morale.[7] Mark Clodfelter has highlighted the capability of air power to 'crack military will in individual operational instances' [8], while Stuart W. Peach has pointed out that the psychological impact of air attacks can matter a great deal in modern campaigns.[9] Few air power studies, however, delve in depth into the morale effect of air power or provide much evidence, beyond the use of quotes from individual combatants, to show that morale is clearly and demonstrably affected by attacks from the air. This paper aims to provide a deeper perspective on the morale effect of air power by studying the North African campaign of the Second World War. It will provide evidence to show that air power played a crucially important role in both inculcating front-line morale and destroying it and, thus, critically influenced success and failure on the battlefield.

The paper will use a number of sources to provide a broader perspective on the relationship between morale and air power. In particular, it will rely on the weekly censorship summaries of the soldiers' mail. About one letter in every thirteen or fourteen sent by the soldiers in the desert was examined by the army authorities, to assess the troops' morale and the issues that were affecting it. These summaries described in detail the state of morale of the constituent parts and nationalities of Middle East Command, as well as the causes of good or bad morale. The summaries covered morale as widely and deeply as possible and only expressed views

that represented a considerable body of opinion among the troops in the desert, not isolated instances of over-exuberance or ill-temper.[10] Every quarter, the Commander-in-Chief in the desert was obliged to write a report, compiled from these summaries and material available at divisional and brigade headquarters, on the state of morale of his troops. All these reports were subsequently passed on to London for inclusion in the War Office quarterly morale reports begun by the Adjutant General, Sir Ronald Adam, in February 1942 for his newly devised Morale Committee.[11] These, less detailed, official appraisals and other documents related to morale are also included in this analysis.

Finding agreement on what the term morale actually means is a considerable challenge. Indeed, three broad approaches to the definition of morale are readily identifiable in the literature.[12] The first describes morale as an affective state. British Defence Doctrine, for instance, defines morale as 'a sense of confidence and well-being'.[13] The second considers morale as an aspect of group dynamics. According to Kimmel, O'Mara and Babin, 'most military writers and some organizational theorists describe [morale] as an organizational variable characteristic of the unit as a whole'.[14] The third associates morale more closely with motivation, for example, Britt and Dickinson define morale as 'a service member's level of motivation and enthusiasm for accomplishing mission objectives'.[15]

There are major problems with both the first and second commonly used definitions. Troops can enjoy positive affective states while behaving in a manner that is completely contrary to the best interest of the military. For instance, a combatant might feel 'good' due to the fact that he has run away and is now safe from harm. Strong group bonds can also undermine positive military performance, such as happened in Vietnam when the importance of group survival often outweighed the need to complete assigned tasks.[16] It is also reductive to suggest that morale can only exist in the context of a group. Individual morale is influenced by a complex range of multi-dimensional factors that go far beyond simple group dynamics.

The third definition gets closer to the mark in linking morale with motivation. However, it is important to differentiate between morale and enthusiasm. Individuals can be highly motivated to carry out tasks that they don't want to do, because they are disciplined or even coerced into action. Morale, therefore, can be defined as the willingness of an individual or group to prepare for and engage in an institutionally encouraged action or activity. This willingness may be engendered by a positive desire to act and/or by the discipline to accept orders to act. This definition clearly links morale with positive military performance and, therefore, makes sense of the strong emphasis that military organisations place on morale. It does not conflate morale with mood or group dynamics. Instead it recognises that military institutions require their personnel, first and foremost, to be willing to carry out orders. If troops are willing to carry out orders, any military will have a chance of success irrespective of the mood of their men and women or the cohesiveness of their groups. Morale, as General Sir Bernard Law Montgomery famously wrote, can, therefore, be recognised as the 'big thing in war'.[17]

The desert war provides an ideal case study to examine the relationship between air power and morale. Indeed, Montgomery and his generals, in their accounts of events in North Africa, placed morale at the centre of the story.[18] More recently, this author has argued that Eighth Army's failures, at Gazala and Tobruk in May and June 1942 and on the El Alamein line in July 1942, were influenced significantly by a morale crisis manifested in extremely high rates of sickness, battle exhaustion, desertion and surrender. This situation was rectified in dramatic fashion, leading to a turnaround in the fortunes of Eighth Army between September and November 1942. This turnaround was driven by a resurgence of morale that decisively influenced the performance of Eighth Army at the climatic battle of El Alamein in October and November 1942.[19]

The character of war in North Africa highlighted differences in the quality of each side's equipment and technology. With little cover and almost limitless space, air power played a central role almost unequalled in any other theatre in the Second World War. Both the British and Germans viewed bombardment from the air as much from the point of view of disintegration of enemy morale as from that of material destruction.[20] For instance, the Germans' main close air support weapon, the Stuka dive-bomber, was employed with morale effects in mind. Elements of the Stuka's attack, such as the use of sirens attached to the bottom of the dive-bomber, the extreme angle of their descent (70-80 degrees) and the low height at which they dropped their bombs (c. 500 feet),[21] played havoc with the psychology of the bombed soldier. Successive British reports, written during 1941 and on into 1942 and 1943, highlighted this fact. A report on the lessons learned in the Crete campaign in 1941 concluded that 'the dive bomber is most inaccurate [but] has an **unnecessary** detrimental effect on morale.'[22] Another British report, written after the 'Crusader' offensive (November 1941 to January 1942), once again noted that 'dive bombing on an average does practically no damage' and that 'every effort should be made to educate gun detachments to this fact. They soon realise it after experience in action, but are apt to overestimate the potential of dive bombing before they have gained experience.'[23]

A study on 'the moral effect of weapons,' carried out in 1943 on a group of 300 wounded soldiers in North Africa, illustrates this point. From the sample, 176 soldiers had experienced dive-bombing during the campaign. Of these soldiers, only 9 per cent suffered wounds. As a comparison, 60 per cent of those who had faced a German 88mm anti-tank gun had been wounded. Nevertheless, 40 per cent of those who had experienced dive-bombing attacks regarded the Stuka as their 'most disliked' weapon.[24] The study reported that the dive-bomber was 'disliked to an extent out of all proportion to its real effectiveness.'[25] Furthermore, 48 per cent of men disliked being bombed by dive-bombers more as time went on. This was compared with 33 per cent of men who disliked it less. The findings pointed to a lack of rationality among soldiers when faced with what the report called 'moral weapons'.[26]

Warfare in the desert was as much about bluff and psychological supremacy as anything else. The study on the 'Moral Effect of Weapons' further illustrates this point.

Table One: Reasons for Disliking Weapons

Reason for Disliking Weapon	Percentage
Effectiveness (i.e. lethality and destructiveness)	19%
Accuracy	21%
Inability to retaliate	13%
Create a feeling of vulnerability	15%
Speed and surprise of attack	10%
Suspense	5%
Noise	5%
'Demoralizing effect' (admitted)	12%

The report pointed out that only the first two of these explanations (effectiveness and accuracy), representing 40% of the total reasons, were simple, rational physical reasons directly related to the lethality of the weapon in question; 'and even they are frequently attributed to weapons which, on the facts, do not possess them' (for instance, the Stuke dive bomber). The remaining 60% were all dislikes of certain psychological sensations.[27] The report stated that all of the men questioned had had experience of battle and had, in fact, been wounded. 'Yet in the majority of instances they would rather face weapons which they have logical reason to fear may kill them, than weapons which arouse instinctive fear.'[28] The report also pointed to a 'notable demoralising effect' arising from the disadvantageous comparison between British and German weapons generally; 'the feeling of inequality – almost of injustice – appears to be very important.'[29]

The fundamental importance of air power to morale was highlighted in another report, written on 'War Neurosis at Tobruk' by Lieutenant Colonel E.L. Cooper and Captain A.J.M. Sinclair of the Australian Imperial Force (AIF). The report made it clear that during the first two months of the siege, while German planes ruled the skies, and 'when the severity of enemy air raids reached a maximum, there was almost a complete lack of aerial support from the RAF.' This absence of support from British planes 'for weeks at a time played a large part in the development of war neurosis in some men.'[30] The consequence of repeated experiences with the dive-bomber was that psychologists began to accept that 'a very high standard of morale and courage' was 'required to face enemy attack by Stukas and low flying fighters even if spaced over a long period of time.' It was all important, according to another report written on the 'Battle with the Dive-Bomber at Tobruk', that 'every man . . . must develop to the full the offensive spirit. Those not engaged in manning guns will fire rifles and light automatics. "Going to ground" when weapons are available must be forbidden.'[31] This type of 'active' defence was designed to prevent men from cowering in slit trenches consumed by fear. It was believed that if men fired back they would feel empowered and therefore their morale would be protected.[32] Battle schools in Britain and more realistic training in theatre were also designed to inoculate soldiers to the sounds of war and ideally prevent them from developing irrational fear syndromes caused by 'moral weapons'.[33]

The detrimental effects of dive-bombing on morale were exacerbated in the desert as a consequence of the experiences of many of the British and dominion troops in Greece and Crete in 1941. On 13 October 1941, a month before the opening of the 'Crusader' campaign, the Prime Minister of New Zealand telegrammed Churchill about the upcoming offensive. 'In the light of our experience in Greece and particularly in Crete,' he said, 'you will understand that we are naturally apprehensive lest our troops should again and for the third time be permitted to battle without adequate air support and in circumstances in which they are unable to defend themselves against unrestricted air attacks.' Fraser wanted assurances that 'the question of air support,' which the New Zealand government regarded 'as a vital factor,' had been 'fully considered and appreciated by those responsible,' and that a situation in which New Zealand men were called upon to fight 'without the necessary means of defence and offence' would 'not recur.'[34]

Churchill passed on his New Zealand counterpart's concerns to General Sir Claude Auchinleck, the Commander-in-Chief, Middle East Command, in a telegram sent on 15 October, in which he also referred to the fact that Air Marshal Sir Arthur Tedder, Commander RAF Middle East Command, had been doubtful of his ability to provide the air cover demanded by Fraser. The next day, the War Office once again telegraphed Auchinleck, this time assuring him that 250 Bofors Anti-Aircraft guns were being sent for use by Eighth Army. 'Never more' the telegram continued, 'must the army rely solely on aircraft for its protection against attacks from the air.'[35]

Fraser need not have worried; a dramatic turnaround in the provision of air support was already under way in the desert. In September 1941, the Middle East (Army and RAF) Directive on Direct Air Support was issued under the signatures of the joint Commanders-in-Chief. New techniques for target selection, recognition, and attack were spelt out in detail for the first time. David Hall has highlighted the importance of this initiative, remarking that, 'in the course of the development of army air co-operation it was perhaps the single most important directive issued during the war'.[36]

It is interesting to note how quickly the new system of air support began to have an effect on the morale of Eighth Army. The censorship summary for the week ending 23 September 1941 pointed out that 'since the circulation amongst all ranks of [the new directive] entitled Air support for the Army, no comments regarding non-cooperation from the R.A.F. have been noted'.[37] The censorship summaries reported that by 'the eve of the great Libyan offensive' ('Crusader') the 'increased amount of air support' had made a considerable difference to the morale of Eighth Army. In fact, they reported that 'the morale of the M.E.F. [Middle East Forces] has never been so high.'[38]

The Desert Air Force's performance during 'Crusader' exceeded Tedder's expectations. This proved not only devastating to German and Italian morale but also a major factor in reinforcing the fighting spirit of Eighth Army. The censorship summary for the period 17 to 23 December 1941 concluded that the Royal Air Force's 'overwhelming superiority' and 'incessant

activity' had created a 'tremendous impression' on the troops. 'All those who were concerned in the Crete campaign' agreed that 'the RAF have proved far more devastating than the *Luftwaffe*' ever had.[39] A New Zealand report, written after the battle, confirmed that 'the lack of RAF support "bogy" has been completely banished.' All ranks now 'speak in the highest terms of the work of the RAF.'[40] A South African report stated emphatically that 'air superiority gives ground troops a tremendous moral advantage.'[41] General Erwin Rommel, commander of the *Panzergruppe Afrika*, blamed defeat to a large extent on the material advantages enjoyed by the British and Commonwealth Armies, and specifically on 'the extraordinarily strong enemy air superiority.'[42] The battle report for the *Panzergruppe* on 20 December 1941 wholeheartedly supported Rommel's assertion.[43]

It is clear that by early 1942 the belligerents in the desert war saw air power as an effective morale weapon. By late May 1942, the Axis forces had built up a substantial advantage in aircraft numbers. They possessed 497 serviceable aircraft in the desert while the Desert Air Force had only 190. The Axis also had a superiority in aircraft for the whole Mediterranean theatre of about 1,000 compared to 739.[44] In many ways, the morale crisis that unfolded at Tobruk and on the Gazala line, in May and June 1942, was significantly influenced by this superiority in air power. As the campaign unfolded, British and Commonwealth morale deteriorated, leading to extremely high rates of sickness, battle exhaustion, desertion and surrender.[45] The effects on British morale of the *Luftwaffe's* concentration of firepower was described by one RAF officer, who wrote,

> Jerry gave our forward 'drome . . . a 6 hour bombing raid . . . we suffered no casualties and only 1 plane destroyed and about 1 damaged, it is surprising how little damage bombs do materially but they are damaging to nerves and morale, at night there is nothing more terrifying and kept up [sic] soon gets you down through lack of sleep and nerves, I have not yet seen a man who is unconcerned.[46]

Nevertheless, from the ashes of defeat, the Desert Air Force gradually began to again wrest control of the skies from the *Luftwaffe*. As Eighth Army retreated in a chaotic fashion towards the El Alamein line, the German war diaries show that this gradual turnaround more than any other factor seemed to drain the offensive spirit and morale of the Axis forces.[47] During the first five days of the offensive, 26 to 31 May, British fighters flew only around 1,500 sorties.[48] In the first week of July, a month later, the Desert Air Force flew as many as 5,458 sorties against Rommel's army.[49] The censorship summary for the same week pointed out that the 'general opinion' was that the 'Royal Air Force have been "doing a marvelous piece of work"'. One writer stated that he had never 'seen our planes in such large numbers in the sky'. Another remarked that 'it has been a Godsend to us to have air superiority'.[50] The censorship summary for 8 to 14 July noted frankly that

> The Air Force has never in the past been over-popular with the M.E.F., but it has at last come into its own, and whatever animosity may have existed between the Services, will certainly disappear as a result of this campaign. All personnel gave unstinted praise to the work of

> the Air Force, both for the accuracy of the bombing and the sustained and tireless effort produced. None is more generous in their tribute than personnel who participated in the mass withdrawal and who realize the perfect target they presented to the Axis air force.

One writer stated that 'I never saw so much transport. The whole desert for miles in depth was almost a solid block of lorries, cars, transporters, road machinery, tanks, armoured cars and all kinds of other things. We must have literally thousands upon thousands of vehicles all back safely. For once in our lives we had air supremacy otherwise it would have been sheer murder!'[51] An Australian gunner wrote, 'we are supposed to have 5 to 1 over him [the *Luftwaffe*] in the air, but it seems to me about 50 to 1, and believe me the swine are getting more than they ever gave us, good old R.A.F.'[52]

The war diaries of the German 90th Light Division reinforce this analysis.

> The enemy throws all the Air Force at his disposal into the battle against the attacking Afrika Army. Every 20 or 30 minutes 15, 18, or sometimes even 20 bombers, with adequate fighter protection, launch their attacks. Although the visible success of these heavy and continuous bombing and low-flying attacks is negligible owing to the disposition of the fighting and supply units, the moral effect on the troops is much more important. Everyone prays for German fighter protection . . . Sometimes German fighters appear singly, greeted by the roaring applause of the troops, but naturally they are not in a position to attack such heavy bomber formations.[53]

Rommel had pushed his army so far and so fast that he had completely outrun the *Luftwaffe's* ability to provide air cover. General Navarini, the commander of the Italian XXI Corps, considered the issue of such importance that, on 6 July, he issued an order of the day informing the troops that 'final victory is within your grasp. Do not let yourselves be overawed by some momentary predominance of enemy aviation.'[54] As Niall Barr has argued, 'the Axis air forces had put forth an enormous effort during the battle of Gazala and for the attack on Tobruk but could not sustain this level of activity indefinitely.'[55]

All through the month of July, the newly named *Panzerarmee Afrika* had to labour under this constant bombardment, what the British soldiers began to refer to as the 'shuttle service.'[56] By 22 July, the German war diaries were still reporting that 'the enemy air force is numerically much superior to ours.' It has 'kept up continuous day and night attacks on our troops, it has caused us considerable losses, has brought the Italians' morale down to a very low ebb, [and] has hindered and partly curtailed supply.' Allied air superiority was so complete by late July 1942 that, in addition to the morale damage being done to the *Panzerarmee*, about 30 military transports were being lost a day to air raids.[57]

Matters had comparatively improved for Eighth Army. The censorship summary for 15 to 21 July reported that 'the outstanding feature of correspondence . . . during the past week has

been the magnificent work of the Allied Air Forces,' which were 'responsible in a large measure for the high morale prevailing among all ranks.' The report stated that 'there was hardly a letter which did not contain praise and admiration for the thorough and determined manner' in which the Air Force had 'carr[ied] out its blitzkrieg,' and for the 'splendid protection' it had provided ground forces during the long withdrawal and in the new positions at El Alamein.[58]

As RAF effectiveness increased, soldiers became more and more confident in the capabilities of the RAF compared with those of the *Luftwaffe*. Private E. Kerans of the 9th Durham Light Infantry described how 'the lads used to sit on the sides of their trenches [on the El Alamein line] and in comparative safety watch for hours one dog-fight after another.' The area he remembered 'was a graveyard of planes.'[59] Such dominance caused 'much satisfaction' among the troops, many of them having been frequently on the other end of aerial bombardment. There was also a regularly expressed conviction among the men, that 'eventually the morale of the enemy must break under the constant bombing and machine gunning' carried out by the Desert Air Force.[60]

Eighth Army had survived the Axis onslaught of May, June and July 1942, but by August it had to prepare to defend again, against another attack on the Alam Halfa ridge, Rommel's last major offensive in the Western Desert. Montgomery, Eighth Army's new commander, was aware of the frail confidence of his army and the morale problems that had emerged during the summer months. He therefore decided to fight Alam Halfa as a limited battle. The July battles on the El Alamein line had shown that Eighth Army's strength lay in its determined infantry, the artillery, and the Desert Air Force. Its weaknesses were its armour and its inability to co-ordinate all arms effectively in the attack. Alam Halfa was a battle entirely conceived and executed with these strengths and weaknesses in mind. Montgomery held his armour back and refused to allow it to become embroiled in a tank versus tank battle with the *Panzerarmee Afrika*. Instead he wanted to minimise casualties and concentrate on what his forces could achieve, rather than, like Auchinleck before him, relying on what it was hoped they would achieve. He realised that his troops needed time to develop confidence in both themselves and their new weapons.[61] Montgomery, therefore, decided on an essentially defensive battle in which he would draw Rommel onto his own artillery and anti-tank screen. In many ways Alam Halfa was a British application of German tactics used on a grand scale with the significant help of the Desert Air Force.

A report by the 19th Flak Division for *Panzerarmee Afrika* HQ on the firepower unleashed by the Desert Air Force during the battle of Alam Halfa gives some idea of the damage inflicted on German and Italian morale. The report stated that 15,600 bombs had been dropped on the *Panzerarmee* over the five days of the offensive. These had been distributed over a front averaging 12-15 km in length and 8-10 km in depth. That meant approximately 100 bombs were dropped per square kilometre during the offensive. The methods used by the Desert Air Force were specifically designed to undermine German and Italian morale. The report stated that 'bombs were not dropped simultaneously by all the aircraft in the formation; instead an

extensive area was covered by bombs being dropped one after the other.' The effect of such action on the troops was that 'in addition to the extensive material damage caused, the effect on morale was . . . great. The spirit of the troops was considerably depressed owing to the totally inadequate German fighter cover. Incessant night attacks in particular served to reduce the degree of readiness for action of both officers and men.' This was due to the factors of 'no sleep, continual waiting for the next bombs, [and the] dispersal of units etc.'[62] Indeed, the British censorship summaries recounted a tale where a captured German 'flung himself flat' as a formation of Allied planes flew overhead; '"Gee, he must be bomb happy", remarked one of our men. "And so would you be", replied the prisoner, in perfect English, "if you had them over you every minute for four solid days"'.[63]

The marked superiority of Allied air power had a dramatic effect on the morale of Eighth Army as well. The first line of the censorship summary for 10 to 16 September 1942 recorded that 'the predominant feature of correspondence from all ranks of British troops in the Western Desert' was the 'general appreciation of the massive support given to our land forces by the Allied Air Forces, which has affected morale to an incalculable degree.'[64] The summary for 17 to 23 September also emphasised the performance of the Allied Air Forces. A gunner wrote, 'air co-operation was perfect and we'd only to name a target to have the R.A.F. bombing it ten minutes later . . . We drove their stuff . . . into groups and then left them to the R.A.F.' Another soldier stated, 'we harried him a good deal on his way back but didn't get really heavily involved. Our artillery and the R.A.F. gave him absolute hell and I sat on one ridge all day about 5,000 yards from a *Panzer* Division which the R.A.F. bombed every 45 mins and which the big gunners put about 10,000 shells into in one day. It was the most incredible sight I have ever seen and gave our chaps considerable satisfaction. We took some of those particular Germans prisoner the following day and they said it was [by] far the worst day they had ever experienced.'[65]

Two months later at the battle of El Alamein, the British and Commonwealth forces in the desert had nearly 200 more planes than the Axis forces facing them (around 530 versus 350).[66] Overall Eighth Army possessed a rough two to one material advantage. However, Eighth Army had enjoyed quantitative advantages previously and still been defeated by the *Panzerarmee*. Montgomery stressed, in his message to the troops on the eve of the great offensive, that this time it was different, that Eighth Army was 'ready NOW . . . We have first-class equipment; good tanks; good anti-tank guns; plenty of artillery and plenty of ammunition; and we are backed up by the finest air striking force in the world.'[67] Brad Gladman has pointed out that 'the improvement in close air support provisions for Eighth Army had a massive impact on morale'. Indeed, it only took 30-40 minutes for close air support to arrive in support of ground troops at El Alamein, as opposed to an average of three hours during the 'Crusader' operation of late 1941.[68] The morale report for August to October, 1942 stated that:

> the knowledge that the tools at their disposal were more numerous and effective than they have ever been, brought the spirit of the troops to a new high level and intensified

> their assurance and grim determination which was to be fully tested and proved to the hilt in the twelve historic days that followed. On the evidence of this mail no army ever went to battle with higher morale.

It went on to point out that there had been 'three main topics of praise from Egypt and Libya . . . (i) rations, (ii) medical services, (iii) the R.A.F.'.[69]

The German war diaries identified a number of reasons for defeat at El Alamein. One of these was 'the continual heavy day and night bombing attacks, against which there was no defence' and which 'only added to the feeling of inferiority' suffered by the troops of the *Panzerarmee*.[70] Indeed, John Terrain has pointed out that between 23 October to 4 November, the RAF flew 10,405 sorties and the Americans 1,181 (on the Axis side, the Germans flew 1,550 sorties and the Italians about 1,570).[71] According to Alfred Price, these attacks often failed to inflict serious damage or casualties, yet the ever-present threat of them proved extremely effective in destroying morale; 'if one fell across an enemy troop or vehicle concentration, the effect of more than a hundred closely spaced 250 and 500 pound bombs detonating in a few seconds caused a shock effect similar to that now produced by a B-52 operating in the battlefield support role'.[72]

The desperate situation of the Axis forces, as a consequence of these bombing attacks, was illustrated by an Ultra intercept on 8 October 1942. Fuel and ammunition supplies were described as severely strained, but the rations situation was 'extraordinarily bad'. Fats were entirely lacking, flour would last 11 days only if the bread rations were cut, 'vegetables, fruit especially lemons, and extras such as jam either not available or completely insufficient'.[73] The result of this, according to Gladman, 'was under-nourishment, a sharp decrease in efficiency, high rates of sickness, and undoubtedly poor morale'.[74] Indeed, a large proportion of German casualties, as was the case with Eighth Army in the summer battles of 1942, were attributable to issues related to morale. The statistics show that 40 per cent of German and 63 per cent of Italian casualties were missing or prisoners of war; the rate for British and Commonwealth troops during the battle was 17 per cent.[75] In addition, extremely high sickness rates, a sure sign of morale problems, removed large numbers of men from the front line.[76] Mark Harrison has estimated that nearly one in five Germans were listed as sick during the battle, with the elite German 15th *Panzer* Division suffering a sickness rate as high as 38 per cent.[77] Problems with desertion and surrender prompted Rommel to encourage use of the death penalty at court marshal during July;[78] these problems persisted into October and November.[79] The fighting ability of the Axis forces in both a 'moral and material sense' had been destroyed.[80]

As David Hall has argued, 'success in battle depended on the degree to which the army and the air force assisted each other, not as ancillary to the other but as equals in pursuit of a common objective.'[81] This was not only because integrated and coordinated use of air and land forces could destroy the material means at the disposal of an enemy, but also because

it had a powerful effect on the morale of the forces engaged. The disasters that beset Eighth Army in the summer of 1942 were significantly influenced by a crisis in morale that fed into poor and ineffective combat performance. This crisis in morale was turned around in dramatic fashion at Alam Halfa and El Alamein leading to more effective performance and ultimately victory in North Africa. This paper has shown that the presence, or lack of it, of effective air support played an important role in this recovery of morale and in the gradual erosion and destruction of German and Italian willingness to fight. Practitioners, theorists and historians must take full account of the extent to which air power is a morale weapon if they are to best understand the past and utilize air power to its full effect today and in the future.

Notes

[1] Brad Gladman, 'The Development of Tactical Air Doctrine in North Africa, 1940-43' in Seb Cox and Peter Gray (eds.), *Air Power History: Turning Points from Kitty Hawk to Kosovo* (London, 2002); Brad W. Gladman, 'Air Power and Intelligence in the Western Desert Campaign, 1940-43', *Intelligence and National Security*, vol. 13, no. 4 (1998), pp. 144-62; David Ian Hall, 'The Long Gestation and Difficult Birth of the 2nd Tactical Air Force (RAF)', *Air Power Review*, vol. 5, no. 3 (2002), pp. 21-33; David Ian Hall, *Strategy for Victory: The Development of British Tactical Air Power, 1919-1943* (**www.praeger.com**, 2007); Alfred Price, 'Air Power at El Alamein', *Air Power Review*, vol. 5, no. 3 (2002), pp. 67-81; John Terrain, *The Right of the Line: The Royal Air Force in the European War 1939-1945* (Ware, 1997).

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[3] Gladman, 'Air Power and Intelligence in the Western Desert Campaign', *Intelligence and National Security*, p. 144.

[4] Gladman, 'The Development of Tactical Air Doctrine in North Africa, 1940-43' in Cox and Gray (eds.), *Air Power History*, p. 194.

[5] Hall, *Strategy for Victory*, intro., p. 2.

[6] For an overview of the development of some of these doctrines see: Stephen Budiansky, *Air Power: The Men, Machines, and Ideas that Revolutionised War, from Kitty Hawk to Gulf War II* (London, 2004); Philip S. Meilinger, 'Trenchard and "Morale Bombing": The Evolution of Royal Air Force Doctrine Before World War II', *The Journal of Military History*, vol. 60 (April, 1996), pp. 243-70.

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